

I claim:

1. Apparatus for testing circuitry having an array of solder-ball contacts or connection probes of a selected size, said solder-ball contacts having a contact area and a peripheral area comprising:

a support substrate having a working surface;

a multiplicity of conductive pads mounted on said working surface;

a multiplicity of conductive pathways extending from said multiplicity of conductive paths to test circuitry;

at least one conductive member formed on each of said multiplicity of conductive pads and extending away from said working surface; and

said conductive members formed on said conductive pads positioned on said support substrate to make an electrical connection with said peripheral area of said solder-ball contacts or connection points of a circuit placed against said apparatus.

2. The apparatus of Claim 1 wherein said at least one conductive member formed on said conductive pads comprises two conductive members located to receive said peripheral area of a solder-ball contact for making said electrical connection.

3. The apparatus of Claim 1 wherein said at least one conductive member formed on said conductive pads comprises three conductive members located to form an interconnection nest for making said electrical connection with said peripheral area.

4. The apparatus of Claim 1 wherein said at least one conductive member formed on said conductive pads comprises at least four conductive members located to form an interconnection nest for making said electrical connection with said peripheral area.

5. The apparatus of Claim 1 wherein said at least one conductive member is formed from one of gold wire and aluminum wire.

6. The apparatus of Claim 1 wherein said at least one conductive member formed on each of said conductive pads comprises a length of wire bonded to said conductive pad.

7. The apparatus of Claim 6 wherein said length of wire comprises a formed length of wire having each end thereof bonded to said conductive pad.

8. The apparatus of Claim 6 wherein said formed length of wire is formed with a raised area in the middle thereof.

9. The apparatus of Claim 8 wherein said length of wire with said raised area is covered with a mold compound to provide rigidity.

10. The apparatus of Claim 1 wherein said support substrate comprises a planar insulating material and said conductive pathways comprise conductive traces formed on said planar insulating material.

11. The apparatus of Claim 10 wherein said conductive pathways are formed on said working surface.

12. The apparatus of Claim 10 wherein said conductive pathways are formed substantially on a surface opposite said working surface and extend from said opposite surface through said insulating material to a conductive pad on said working surface.

13. The apparatus of Claim 1 wherein said conductive members are stud bumps deposited by a wire bonding machine.

14. The apparatus of Claim 13 wherein one or more of said conductive members comprise stud bumps bonded on top of another stud bump.

15. The apparatus of Claim 5 wherein said conductive members are stud bumps deposited by a wire bonding machine.

16. The apparatus of Claim 5 wherein said conductive members are stud bumps deposited by a wire bonding machine.

17. Apparatus for testing circuitry having an array of solder-ball contacts of a selected size with a contact area and peripheral area comprising:

a planar insulating support substrate having a working surface and a back surface;

a multiplicity of conductive paths forms on said working surface;

conductive pathways formed on said working surface leading from said multiplicity of conductive pads to testing circuitry;

at least three conductive lengths of wire extending away from said working surface bonded to selected ones of said multiplicity of conductive pads by a wire bonding machine to form an interconnecting nest; and

said interconnecting nest positioned on said support substrate to receive a solder-ball contact point and making an electrical connection with said peripheral area of said received solder-ball for testing said circuitry.

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18. A method of manufacturing testing apparatus for circuitry having an array of solder-ball contacts of a selected size and having a contact area and peripheral area comprising the steps of:

providing a support substrate having a working surface and a multiplicity of conductive pads mounted on said working surface;

extending conductive pathways from said multiplicity of conductive pads to testing circuitry;

forming at least one conductive member on each one of said multiplicity of conductive pads, said conductive member extending away from said working surface; and

positioning said first multiplicity of conductive paths with said conductive member on said support structure such that said conductive members are aligned so as to make electrical contact with said periphery area of said array of solder-ball contact points of a circuit placed against said testing apparatus.

19. The method of Claim 18 wherein said step of forming comprises forming at least two conductive members.

20. The method of Claim 18 wherein said step of forming comprises forming at least three conductive members.

21. The method of Claim 18 wherein said step of forming comprises forming at least four conductive members.

22. The method of Claim 18 wherein said step of forming at least one conductive member comprises a step of depositing stud bumps on said conductive pads with a wire bonding machine.

23. The method of Claim 18 wherein said conductive members are formed from one of gold and aluminum wire.

24. The method of Claim 18 and further comprising the step of placing circuitry having an array of solder-ball contact points against said apparatus and testing said circuitry.

25. A method of manufacturing testing apparatus for circuitry having an array of solder-ball contact points of a selected size and a contact area and a peripheral area comprising the steps of:

providing a support substrate having a working surface and a multiplicity of conductive paths formed on said working surface;

forming conductive pathways from said multiplicity of conductive paths to testing circuitry;

depositing at least three stud bumps on said conductive pads with a wire bonding machine to form interconnecting nests for receiving a solder ball contact point; and

positioning said interconnecting nest on said support structure such that said stud bumps are aligned so as to make electrical contact with said array of solder-ball test points of a circuit placed against said testing apparatus.